REMARKS

This Amendment is in response to the January 22, 2007 Office Action. Prior to the Office Action, claims 1-23 were pending. In view of this Amendment, claims 1, 4-5, 8-17 and 20-32 are pending. Claims 2, 3, 6, 7, 18 and 19 have been cancelled. Claims 24-32 have been added. Claims 1, 4, 14, 15, 17 and 20 are amended. The specification has been amended to correct a typographical error.

Claims 1-7, 11, 13 and 15 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,861,910 to McGarry in view of U.S. Patent No. 7,031,791 to Chang. The Examiner generally asserts that McGarry discloses a non-oriented optical character recognition apparatus that takes a plurality of sequential line images to produce an image, an illumination device which projects two different types of illumination in a synchronous manner with the taking of the line images, and a processor for separating the wafer image into at least two separate wafer images of different illumination. The Examiner cites Chang as disclosing the traveling of the wafer to be imaged with respect to the imaging system which is lacking in McGarry. These assertions as to the structure, function, as well as the combination of the references, are traversed.

McGarry discloses an image formation apparatus for viewing stationary indicia located in a generally known area on a planar specular substrate. McGarry discloses use of a circuit board (22) having a plurality of illumination elements (24) and (25) disclosed as LEDs. The apparatus discloses use of a diffuser layer (26) which permits brightfield illumination and an opaque mask layer (28). A slot aperture (34) is used to selectively permit the passage of limited light rays emitted from the illumination elements to an image plane (55) where an image sensor (55) receives the permitted rays and reflected image. Through use of the diffuser (26), opaque mask (28), slot aperture (34) and selective activation of one or more rows of illumination elements (24) and (25), reflection or absorption of the rays in the specific area of the indicia are disclosed to produce a readable image of at least a portion of the indicia. An extended darkfield embodiment

is disclosed wherein two darkfield images of the indicia area are separately taken and projected using alternate darkfield illumination elements on circuit board (22). The two darkfield images are combined after receipt of the images. This is disclosed as enabling inspection and projection of a wider indicia area as opposed to a single image of a smaller area. Col. 12 ll. 36-59.

McGarry, nor any of the other references of record, disclose the apparatus and method of the present invention which takes numerous, separate and sequential line images across a substantial portion of the wafer surface as the wafer moves along a path of travel wherein the wafer markings can be located and read.

Claim 1 has been amended to clarify the taking of the sequential line images, of different portions of the wafer image across a substantial portion of the wafer, as the wafer moves along the path of travel. McGarry discloses the generation of an image of only a minute portion of a stationary specular substrate where the indicia is believed to be, for example region (74) in Fig. 4. Col. 9 ll. 9-10. There is no teaching or suggestion of taking numerous sequential line images across a substantial portion of a wafer.

McGarry further does not disclose alternating of different types of illumination in synchronicity with the taking of the line images in a repetitive manner across the wafer. In the McGarry extended darkfield embodiment noted by the Examiner, although different illumination elements are used to produce two images, they are disclosed as both darkfield illumination elements (38) and (40), and thus not different types, for example brightfield and darkfield.

McGarry further does not teach or suggest the claimed separation of sequentially taken line images under alternating illumination into at least two separate wafer images, each individual wafer image having line images of the same illumination type. Again, applying the extended darkfield embodiment cited by the Examiner, McGarry's two darkfield images are disclosed as being combined, not separated into separate images, or separate images of different illumination type.

Applicant further asserts that the combination of McGarry and Chang is improper as there is no teaching, suggestion or motivation to apply the high-speed moving processing line of Chang to the stationary image apparatus of McGarry. There is no teaching or suggestion to modify the stationary image forming apparatus of McGarry so the image can be taken while the substrate moves along a path of travel. Applicant asserts the addition of high-speed movement of the McGarry specular substrate would render the McGarry apparatus and disclosed method of generating the McGarry image inoperable and/or unworkable.

Claims 2 and 3 have been cancelled without prejudice.

Claim 4 has been amended to further clarify the operation of the claimed cameras and is not rendered obvious for the reasons stated in claim 1.

Claim 5 is allowable as being dependent on allowable base claim 1 and in further view that McGarry neither McGarry of Chang teach or suggest use of all of the types of illumination claimed or in the manner supported by claim 1.

Claims 11 and 13 are allowable based on dependency from allowable base claim 1.

Method claim 15 claims, in part, the generation of a single interlaced image of a plurality alternately illuminated line images taken separately and sequentially across substantially the entire wafer surface. Neither McGarry or Chang teach or suggest the taking of line images under alternating illumination as explained by applicant above. The portions of McGarry cited for the proposition that a plurality of line images are taken under different illumination types are unsupported as explained by applicant under claim 1 respecting the McGarry extended darkfield embodiment. As neither McGarry nor Chang teach or suggest the method step of taking of the sequential and alternating line images as claimed, neither reference discloses the generation of a single interlaced image comprising such line images.

Claims 17-19 and 21-23 are rejected under 35 U.S.C. § 103(a) as being unpatentable over McGarry and U.S. Patent No. 6,671,397 to Mahon. The Examiner maintained the asserted disclosures of McGarry above as applied to a method. The Examiner asserts that Mahon

discloses separation of an image into a plurality of images through use of a filter (22).

These asserted structural features, functions and combination of the references are traversed.

With respect to method claim 17, McGarry does not teach or disclose a method of generating a least one wafer image through sequential line images taken of different portions of the wafer under alternating different types of illumination across a substantial portion of the wafer.

The Examiner applies Mahon for the teaching of separation of the images of different illumination type. The separation limitation in claim 17 has been removed and claims 18 and 19 have been cancelled. Applicant asserts that under the rejection as stated, Mahon is no longer applicable to claim 17.

Claims 21 and 22 are allowable as McGarry does not teach or suggest conducting geometric transforms to enhance or correct the taken images as asserted. McGarry merely discloses the combination of two separately taken images to increase the area of inspection the indicia is believed to be in. Col. 12 ll. 54-59. Reconsideration is requested.

Claim 23 is allowable based on dependency from allowable base claim 17.

Claims 14 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over McGarry in view of Mahon as applied to claim 17 and further in view of U.S. Patent No. 5,825,913 to Rostami.

Mahon generally discloses a measurement system using two cameras and two light sources to capture two separate images for 2 and 3 dimensional inspection of an object. It is disclosed that the two images can be taken simultaneously.

Rostami discloses a system for finding the orientation of a wafer through taking of an image and thereafter calculating edge points, the center of the wafer and then generation of curved band and straight band images to locate wafer notches or flats.

The combination of Rostami to McGarry and Mahon is improper as there is no teaching,

suggestion or motivation to combine the wafer orientation system of Rostami to the surface indicia inspection apparatus of McGarry or measurement system of Mahon. Neither McGarry or Mahon teach, suggest or identify a need for apparatus or processes that identify the orientation of a wafer as taught in Rostami.

Claim 14 has been amended to clarify the claimed invention. As generally argued for method claim 15, McGarry does not teach or suggest the generation of the single interlaced image from sequential line images of different portions of the wafer under alternating illumination. Claim 15 further limits the line images to be taken across substantially the entire wafter surface. McGarry further does not teach or suggest the separation of the single interlaced image into separate images having line images of the same illumination.

Mahon does not teach or suggest the claimed separation of a single interlaced image of sequential line images. The separation of Mahon images by the filter (22) language noted by the examiner in Col. 3 ll. 43-49 is explained later in the patent as simply shutting out, separating or filtering out the light from light source (30) so as to not corrupt or interfere with the image taken by oblique camera image sensor (10). Col. 6 ll. 14-18. Therefore, Mahon does not teach or suggest the separation of an interlaced image as claimed. Mahon further does not teach or suggest the use, or alternating use, of different types of light sources, for example brightfield or darkfield, but rather, only differently positioned light sources (30) and (31). There is no teaching or suggestion in McGarry or Mahon of the generation of a single, interlaced image of alternately illuminated line images, or thereafter, separating the single interlaced image into separate wafer images of the same illumination type.

Claim 20 is allowable based on dependency of allowable base claim 17. Further, Rostami does not teach or suggest the identification of the claimed edge, notch and center of the wafer image. It is not clear where the Examiner finds support that Rostami selects "at least one of the separated images" as asserted. Applicant finds that only one image of the wafer is taken in Rostami.

Claims 12 and 16 are rejected as being unpatentable under 35 U.S.C. § 103(a) over McGarry in view of Chang as applied to claims 1 and 15 and further in view Rostami.

Claim 12 is allowable based on allowable base claim 1. See Applicant's remarks on the operation of Rostami under claim 14 and 20 above. Claim 16 is allowable based on dependency from allowable base claim 15. Further, respecting claim 16, McGarry does not disclose separation of a single, interlaced image of line images illuminated by different types of light. The combination of Rostami is improper as described above and does not render the claim unpatentable as obvious. Reconsideration is requested.

Claims 8-10 are rejected under 35 U.S.C. § 103(a) as being unpatentable over McGarry in view of Chang as applied to claim 1 and further in view of Mahon. These claims are allowable based on dependency from allowable base claim 1.

It is asserted that new claims 24 through 32 are not anticipated or rendered obvious by any of the references of record alone, or in permissible combination, and are, therefore, in a condition for allowance.

It is respectfully submitted that this Amendment traverses and overcomes all of the Examiner's rejections to the application as originally filed. It is further submitted that this Amendment has antecedent basis in the application as originally filed, including the specification, claims and drawings, and that this Amendment does not add any new subject matter to the application. Reconsideration of the application as amended is requested. It is respectfully submitted that this Amendment places the application in suitable condition for allowance; notice of which is requested.

If the Examiner feels that prosecution of the present application can be expedited by way of an Examiner's amendment, the Examiner is invited to contact the Applicant's attorney at the telephone number listed below.

Respectfully submitted,

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